STATE OF TENNESSEE
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**DIVISION OF WATER RESOURCES**
Memphis Environmental Field Office
8383 Wolf Lake Drive
Bartlett, TN 38133
Phone 901-371-3000 Statewide 1-888-891-8332 Fax 901-371-3170

CERTIFIED MAIL: 91 7108 2133 3932 2020 7414
RETURN RECEIPT REQUESTED

December 2, 2016

Mayor Jim Strickland
City of Memphis
125 North Main Street, Room 700
Memphis, TN 38103

Re: Notice of Violation (NOV)
Compliance Evaluation Inspection
Memphis-TE Maxson STP
NPDES Permit No. TN0020729
Shelby County

Dear Mayor Strickland:

On Wednesday, October 19, 2016, Mr. Eddy Bouzeid with the Division of Water Resources, Memphis Environmental Field Office (DWR/MEFO), conducted a Compliance Evaluation Inspection (CEI) of the Memphis-TE Maxson Sewage Treatment Plant (STP). Upon arrival at the facility, Mr. Bouzeid met with Mr. Mike Brower, the plant manager, and Mr. Henry Clark, the plant process manager, and stated that the purpose of the inspection was to evaluate the plant's compliance with its National Pollutant Discharge Elimination System (NPDES) permit. This was accomplished by reviewing the facility's self-monitoring records and reports and subsequently conducting an inspection of the plant. Attached you will find the Compliance Evaluation Inspection Report and corresponding photo documentation which summarize the findings of the CEI.

As is noted in the inspection report the plant experienced 132 exceedances of its NPDES permit limits during the evaluation period from May 2014 through September 2016. However, most of the exceedances (105 exceedances) appear to have been caused by inflow/infiltration in the collection section caused by the flood stage of the Mississippi River during the first quarter of 2016 (January through March). The City reported the remaining 27 exceedances to be caused by the Stiles laboratory inadvertently failing to send a set of samples for analysis off-site (14 exceedances); the aeration basins dissolved oxygen levels decreasing following high daily influent BOD (9 exceedances) on couple occasions; and excessive TSS in the system during the transition from a period of cold weather to warm weather causing finely suspended material not to settle easily in the final clarifiers (4 exceedances).

As mentioned above, please understand that this CEI report and associated NOV covers the time span of May 2014 through September 2016. However, the Division acknowledges that a separate NOV was issued to the City of Memphis on June 20, 2016, for the effluent violations that occurred in the first quarter of 2016 which appeared on the EPA Quarterly Non-Compliance Report. Please be aware that this NOV is being issued in response to the October 2016 CEI, due to the fact that permit exceedances occurred during the May 2014 to September 2016 timeframe, in addition to those reported during the first quarter of 2016.

Additionally, the Division is aware that portions of the collection system transporting wastewater to the Maxson plant is undergoing major rehabilitation activities at of the time of the inspection. The 96 inch sewer line which is part of the collection system and which transports a substantial volume of wastewater to the plant collapsed at the end of March 2016 and is undergoing major rehabilitation work due to line failure. Several pumparound systems have been installed to transport the wastewater to the plant during the rehabilitation work. Additional information regarding the collection system will be discussed in a separate report, which will specifically cover the collection system. This report will be generated after a subsequent inspection of the collection system is conducted, which will be forthcoming.

At the time of the inspection it appeared that the Memphis–TE Maxson was properly operating and maintaining all facilities and systems at the treatment plant. However, the City should continue to implement appropriate actions/mechanisms and maintenance measures to ensure compliance.

Required Action:

- On or before January 6, 2017, please submit a written response indicating what corrective actions the City has undertaken or plans to undertake to eliminate future exceedances at the plant.

The Division appreciates Mr. Brower and Mr. Clark's cooperation and assistance during the inspection and the City's continued efforts to comply with its NPDES permit

requirements. If you have any questions or comments with regard to the inspection please contact Eddy Bouzeid at (901) 371-3023 or eddy.bouzeid@tn.gov.
Sincerely,

Joellyn Brazile, CPESC

Environmental Program Manager
Division of Water Resources
Memphis Environmental Field Office

cc: TDEC/DWR/NCO, Enforcement & Compliance
TDEC/DWR/MEFO – File

ec: Paul Patterson – City of Memphis
Mike Brower – City of Memphis
Don Hudgins – City of Memphis

# TDEC - Division of Water Resources
# Memphis Field Office

## ICIS NPDES Facilities Inspection Report

### Facility Data

| | | | |
|---|---|---|---|
| NPDES ID: | TN0020729 | Facility Site Name | Memphis-TE Maxson STP |
| | | Address | 2685 Steam Plant Road, Memphis, Shelby County, Tennessee |
| Permit Eff. Date: | Jan 1, 2012 | Permit Exp Date: | Dec 31, 2016 |
| SIC Code: | | | |

### Compliance Monitoring Information

Compliance Monitoring Activity Name: Compliance Evaluation (non-sampling) (CEI)

* If Bio Monitoring is selected above, select the method used:

Compliance Monitoring Activity: Evaluation

### Compliance Monitoring Dates/Times

Entry Date/Time (mm/dd/yyyy hh:mm): 10/19/2016 8:30 AM

Exit Date/Time (mm/dd/yyyy hh:mm): 10/19/2016 1:30 PM

### Facility Representatives

| On-Site Representative(s)Title, Phone Number | Responsible Official(s), Title, Phone Number |
|---|---|
| Mike Brower, Plant Manager / (901) 789-0510 | Don Hudgins, STP Administrator / (901) 636-4300 |

### Statute and Section Information

| | | | |
|---|---|---|---|
| Federal Statute: | CWA - Clean Water Act | State Statute: | Tennessee Water Quality Control Act |
| Programs: | NPDES- Base Program (Limits, Reporting, & Schedule) | | |
| Compliance Monitoring Reason: | Core Program | | |
| Compliance Monitoring Agency Type: | State | Agency Name: | TDEC - DWR |
| Did EPA assist/ Inspection? | No | Time Physically conducting activity: Days: | 1 Hours: |
| Inspection Type: | State | Compliance Monitoring Action Outcome: | |
| Lead Agency: | State | Compliance Monitoring Rating Code: | Unrated |

If Joint Inspection, what was the purpose of the other party?

### Areas Evaluated During Inspection (*Check only those areas evaluated*)

| | | |
|---|---|---|
| ☒ Permit | ☒ Self - Compliance Program | ☐ Pretreatment |
| ☒ Records / Records | ☒ Compliance Schedule | ☐ Pollution Prevention |
| ☒ Facility Site Review | ☒ Laboratory | ☐ Storm Water |
| ☒ Effluent / Receiving Waters | ☒ Operations & Maintenance | ☐ Combined Sewer Overflow |
| ☒ Flow Measurement | ☒ Sludge Handling / Disposal | ☐ Sanitary Sewer Overflow |

### Compliance Monitoring Summary

See attached inspection report and/or letter.

### EPA and State Representatives

| | | |
|---|---|---|
| Inspector's Signature | TDEC/DWR/MEFO (901) 371-3023 | Dec 2, 2016 |
| | Agency / Office / Phone | Date |
| Manager's Signature | TDEC/DWR/MEFO (901) 371-3025 | Dec 2, 2016 |
| | Agency / Office / Phone | Date |

***(Note: This form can only be printed to an XPS document, then saved for later use.)***

**TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

**Division of Water Resources**

Memphis Environmental Field Office, 8383 Wolf Lake Drive, Bartlett, TN 38133

1-888-891-8332 (TDEC)

**Compliance Inspection for Individual NPDES Permit**

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| | |
|---|---|
| **Facility Name:** Memphis–TE Maxson STP | **NPDES Tracking Number:** TN0020729 |
| **Permit Effective Date:** January 1, 2012 | **Permit Expiration Date:** December 31, 2016 |
| | |
| **Date and Time of Inspection:** 4/15/2016 | **Inspector Name:** Eddy Bouzeid |

| | |
|---|---|
| **Official Contact Person Name:** Don Hudgins, STP Administrator | |
| **Address:** 2303 North 2nd Street, Memphis, TN 38217 | **Phone Number:** (901) 636-4300 |
| | **Email:** Donald.Hudgins@memphistn.gov |

## Summary of Findings and Comments

On Wednesday, October 19, 2016, Mr. Eddy Bouzeid with the Division of Water Resources, Memphis Environmental Field Office (DWR/MEFO), conducted a Compliance Evaluation Inspection (CEI)-at the Memphis–TE Maxson Sewage Treatment Plant (STP) located in Memphis, Shelby County, Tennessee. Mr. Bouzeid met with Mr. Mike Brower, the plant manager, and Mr. Henry Clark, the plant process manager, and reviewed the treatment system's monitoring records and discussed its self-monitoring program. Afterwards, Mr. Bouzeid and Mr. Clark inspected the treatment plant. The following is a summary of the findings and observations:

### I. Permit

The NPDES permit for the Memphis–TE Maxson STP with tracking number TN0020729 expires on December 31, 2016. A copy of the NPDES permit was available for review at the plant. The permit renewal application was submitted to the Nashville Central Office and was received on July 5, 2016.

The NPDES permit authorizes the discharge of treated wastewater effluent into the Mississippi River at mile 725 via Outfall 001.

The design capacity of the treatment system is 90 Million Gallons per Day (MGD). From May 2014 through September 2016, the average effluent flow from the treatment system was 75 MGD and the maximum flow was 158 MGD, recorded in March 2016 when the Mississippi River was at flood stage.

### II. Records/Reports

Site records and reports for the treatment system were observed and appeared to be maintained as required by the NPDES permit. Sampling and analytical data, including flow

records, Discharge Monitoring Reports (DMRs) and Monthly Operation Reports (MORs) for the period from May 2014 through September 2016 were reviewed and appeared to be complete.

## III. Facility Site Review

The Memphis-TE Maxson STP has four influent pumps (two pumps have 50 MGD capacity and two pumps have 70 MGD capacity) in the pump building located at the head of the plant (photo 1). One 50 MGD pump and one 70 MGD pump were in service at the time of the inspection.

The STP consists of four covered grit chambers (photo 2), each with a bar screen, three fine bar screens (photo 3), four primary clarifiers (photo 4), six activated bio-filter (ABF) towers (photo 5), fourteen aeration basins (photo 6) and ten secondary clarifiers (photo 7). Three primary clarifiers and five ABF towers were in operation at the time of the inspection. One primary clarifier was being serviced, four aeration basins and three secondary clarifiers were out of service due to low flow period.

The overflow weirs from the clarifiers appeared clean (photo 8).

From the secondary clarifiers, the treated wastewater is discharged through a channel that also conveys discharge from the TVA Allen Steam Plant before entering the Mississippi River (photo 9).

The odor at the time of the inspection was minimal. The bio-filter installed to reduce the odor at the head of the plant appeared to be performing well. The air from the wet wells, the influent pump house and the grit chambers are vacuumed and filtered by the bio-filter.

The Stiles discharge effluent characteristic and monitoring requirements are as follow:

- BOD – daily composite
- Total Suspended Solids (TSS) – daily composite
- Ammonia-Nitrogen – daily composite
- Organic Nitrogen – monthly composite
- Total Nitrogen – monthly composite
- Total Phosphorus – monthly composite
- E. Coli – daily grab
- Settleable Solids – daily composite
- Dissolved Oxygen – daily grab
- pH – daily grab
- Organic Pesticide Chemicals – annually
- Total Dioxin – annually
- Total Polychlorinated Biphenyls (PCBs) – annually
- Total Chlordane – annually
- Total Mercury – annually
- Methyl Mercury – annually
- Benzidine – annually

- Hexachlorobenzene - annually

The Maxson STP had a total of 132 exceedances of its NPDES permit limits for the period from May 2014 through September 2016.

Four (4) exceedances were reported in June 2014. Two daily BOD concentrations and two daily TSS concentrations. The excursions occurred after aeration basin dissolved oxygen levels decreased following a high daily influent BOD loading (potential slug discharge).

Four (4) exceedances in March 2015. Two daily BOD concentrations and two daily TSS concentrations. The STP received somewhat excessive TSS return from the lagoon system. The transition from a period of cold weather to warmer weather affected the settling in the lagoons. The TSS stream returning to the plant contained finely suspended material that would not easily settle in the final clarifiers. These fine solids escaping over the weirs seem to be the cause of both the BOD and TSS excursions.

Fourteen (14) exceedances in April 2015. Due to a lab error, the ammonia nitrogen, total phosphorous, total nitrogen, and organic total nitrogen samples were not sent for analysis.

Forty three (43) exceedances in January 2016, twenty four (24) exceedances in February 2016, thirty eight (38) exceedances in March 2016. The excursions were attributed to the inflow/infiltration (I&I) in the collection system caused by the flood stage of the Mississippi River.

Five (5) exceedances in July 2016. Two daily BOD concentrations, one TSS daily concentration, one settleable solids daily concentration, one monthly BOD concentration. The excursions occurred after aeration basin dissolved oxygen levels decreased following a high daily influent BOD loading (potential slug discharge).

The Maxson STP also conducted annual biomonitoring (Acute Aquatic Toxicity - 48 hour LC50 on Ceriodaphnia and Pimephales) of its effluent at Outfall 001. The tests were conducted in September 2014, 2015 and 2016. Based on the percentage and variability of the test results, it appears that there is no reasonable potential for the discharge to contain toxics in toxicity amount.

## IV. Effluent/Receiving Waters

The effluent was slightly tan in color and foamy in the concrete structure before leaving the plant (photo 10). The effluent at the outfall feeds into a channel which then travels approximately half a mile before entering the Mississippi River (photo 11).

On a daily basis, a visual observation of the outfall is made and noted in a field observation log as required by the permit. The field observation log is maintained on site and was reviewed. The log allows the operator to check for the presence of floatables, scum, foam, an oil slick and/or an objectionable color contrast.

The sign was in place at the point of discharge at the Mississippi River (photo 12) and the information on the sign was correct.

## V. Flow Measurement

A flow meter is installed in the pump building at the head of the plant (photo 13) to measure the influent. The device appeared to be operating properly during the time of the inspection. According to Mr. Bower the flow meter is calibrated by the manufacturer annually. Records indicate the last calibration was conducted on July 6, 2016. A calibration certification was available for review. Although the permit requires measurement of effluent flow, the influent flow is currently recorded as the effluent flow since the facility does not have an effluent flow meter.

## VI. Self-Compliance Program

As of the date of the inspection, aliquot samples were being collected by plant personnel for the influent and effluent. The plant has an automatic flow proportional sampler (composite sampler) on the effluent. However, the composite sampler was incapable of collecting 125 ml of an individual sample as recommended by EPAs Operating Procedure for Wastewater Flow Measurement. As a result, the composite sampler was decommissioned and aliquot samples are collected instead. The influent and effluent samples are composed of aliquots from manually collected grab samples. The sample aliquots are maintained in the refrigerator at less than or equal to 6 degrees Celsius as required by the permit.

Dissolved oxygen (DO), temperature and pH are field parameters measured at the time of sample collection. Total suspended solids, BOD, ammonia nitrogen, settleable solids and E. Coli – are performed at the Memphis Stiles plant's laboratory. The other analyses, total nitrogen, organic nitrogen, total phosphorus, organic pesticide, total dioxin, heptachlor epoxide, PCBs, total chlordane, total mercury, benzidine and hexachlorobenzene are performed at Waypoint Laboratory in Memphis.

## VII. Compliance Schedule

The Maxson Plant is under a compliance schedule for disinfection of the effluent E. Coli under the NPDES permit. Compliance schedule milestones are provided in the permit.

As of the date of the inspection, the following plans/reports were submitted as part of the disinfection compliance schedule milestones:

1. Develop disinfection investigation work plan: The disinfection investigation report was submitted to the NCO on August 28, 2012.
2. Conduct disinfection investigation (non-chlorination based): progress report #1/disinfection compliance schedule milestone report was submitted on January 31, 2013. The report

was received at the Nashville Central Office (NCO) on February 4, 2013; progress report #2 was submitted on August 9, 2013. The report was received at the NCO on August 14, 2013. The City and its consultant conducted bench scale testing to further refine the potential disinfection options. All potential disinfection options which included chlorination were eliminated for the STO discharge besides Peracetic Acid (PAA).

3. Develop disinfection report: disinfection pilot scale testing report was completed and submitted to the NCO for approval on November 18, 2013. The report proposed the design and construction of a PAA storage and feed facility for the purpose of feeding PAA for disinfection for the Stiles treated effluent.
4. The NCO approved the disinfection approach in a letter dated March 25, 2014, and directed the City to move forward with detailed design.
5. Disinfection Compliance Schedule Progress Report/Milestone Report #3: The progress report was mailed on March 3, 2015, and received by the NCO on March 6, 2015.
6. Disinfection Compliance Schedule Progress Report/Milestone Report #4: The City of Memphis and its consultant CDM Smith, in a letter dated October 9, 2015, informed the NCO that they were working on final design of the PAA performing the work disinfection system. CDM has completed the 60% design plans and specifications and will be issuing pre-procurement documents for the PAA system in the coming months. Following selection of the PAA manufacturer, work will continue to proceed towards completion of construction plans and specifications, which are anticipated to be finalized before the end of 2016.

## VIII. Laboratory

All analyses, other than those to be run within a short time frame, are performed at the Memphis Stiles plant's laboratory. The aliquot samples from the Maxson plant are delivered every morning to the Stiles laboratory and a log book documenting the samples' collection and delivery times is maintained on site and was reviewed.

Calibration of the pH and DO meters was observed. The calibration logs were also inspected and the calibrations were properly documented. The DO meter was calibrated according to the instructions noted in the manufacturer's manual. Three buffers (4, 7 and 10) were utilized in the calibration of the pH meter.

## IX. Operations and Maintenance

It appears that Memphis–TE Maxson is properly operating and maintaining all facilities and systems at the treatment facility. However, the collection system transporting wastewater to the Maxson plant is undergoing major rehabilitation activities at of the time of the inspection. The 96 inch sewer line which is part of the collection system and which transports a substantial volume of wastewater to the plant collapsed at the end of March 2016 and is undergoing major rehabilitation work due to line failure. Several pumparound systems have been installed to transport the wastewater to the plant during the rehabilitation work. Additional information regarding the collection system will be discussed in a separate report, which will specifically cover the collection system. This report will be generated after a subsequent inspection of the collection system is conducted, which will be forthcoming.

## X. Sludge Handling

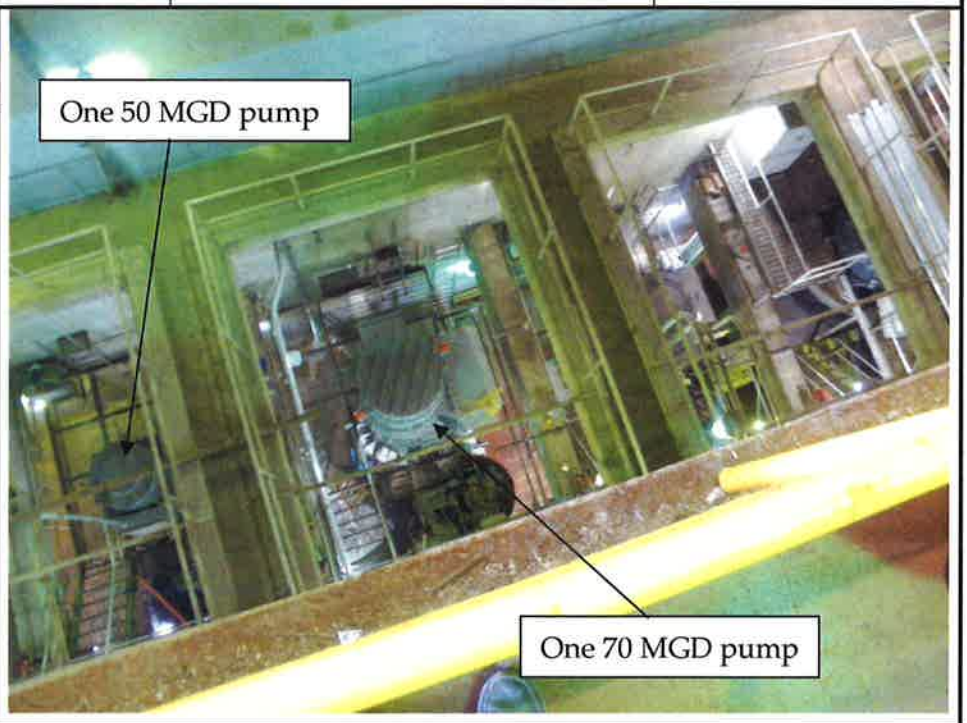
The primary and secondary sludge is stored in four covered anaerobic lagoons for approximately a year during which time the sludge thickens. The lagoons are covered to allow for gas collection. From the covered lagoons, the sludge is transferred to three uncovered lagoons for another year. After approximately two years, the thickened, well digested, pathogen-reduced sludge is land applied in designated fields at the plant. The runoff from the land application sites is rerouted to the head of the plant for further treatment.

# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 1 | 10-19-2016 |

**Description**
View of the influent pumps in the pump building at the head of the plant.




| Photo No. | Date |
|---|---|
| 2 | 10-19-2016 |

**Description**
View of the covered grit chambers.

# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 3 | 10-19-2016 |

**Description**
View of the fine bar screens.

| Photo No. | Date |
|---|---|
| 4 | 10-19-2016 |

**Description**
View of a primary clarifier.

# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 5 | 10-19-2016 |

**Description**
View of the bio-filter towers.

| Photo No. | Date |
|---|---|
| 6 | 10-19-2016 |

**Description**
View of one aeration basin.

# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 7 | 10-19-2016 |

**Description**
View of a secondary clarifier.

| Photo No. | Date |
|---|---|
| 8 | 10-19-2016 |

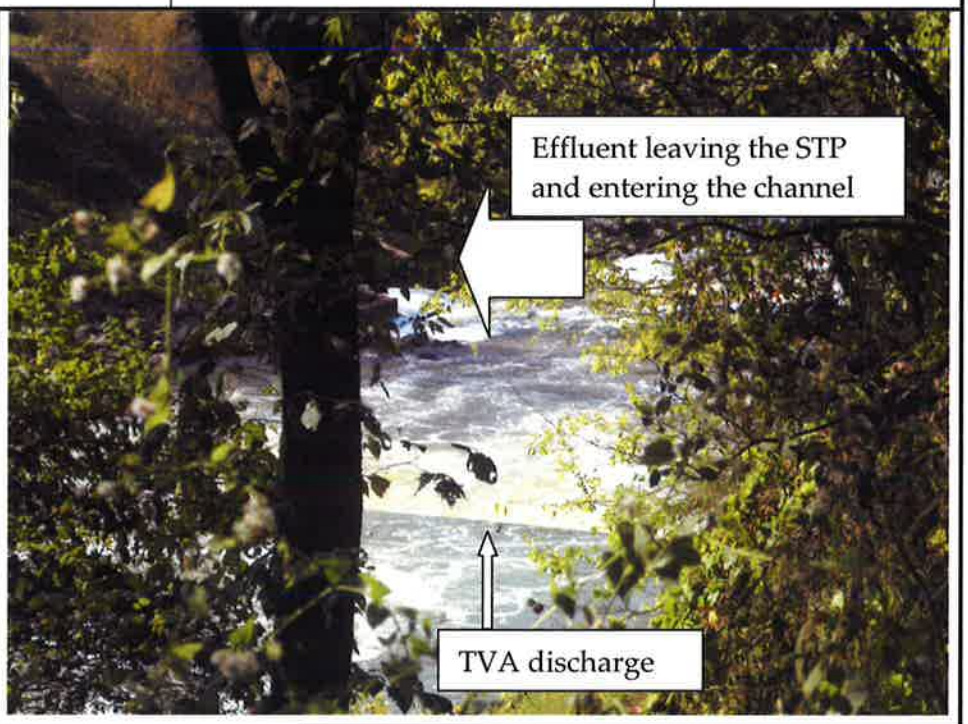
**Description**
Close-up view of an overflow weir from a secondary clarifier.

# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 9 | 10-19-2016 |

**Description**
View of the effluent entering a channel that also conveys discharge from the TVA Allen Steam Plant before entering the Mississippi River.




| Photo No. | Date |
|---|---|
| 10 | 10-19-2016 |

**Description**
View of the effluent in the concrete structure before leaving the plant.

# Photographic Log

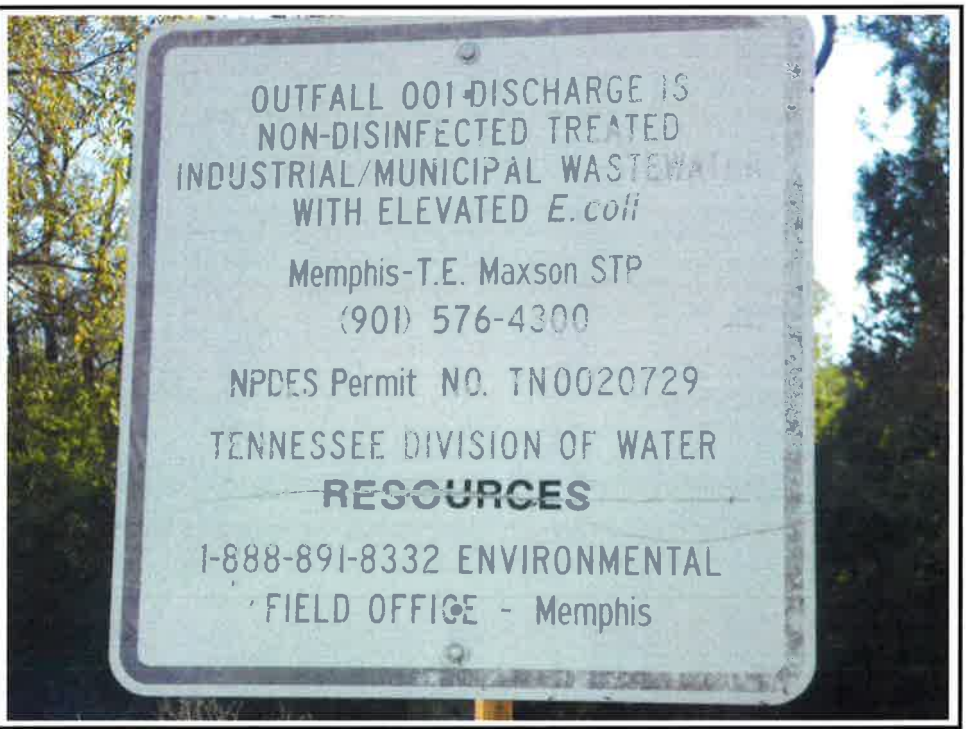
| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 11 | 10-19-2016 |

**Description**
View of the channel that conveys the STP effluent and the TVA discharge before entering the Mississippi River.

| Photo No. | Date |
|---|---|
| 12 | 10-19-2016 |

**Description**
View of the sign at the outfall. All the information on the sign was correct.



# Photographic Log

| Facility Name: | Site Location: | Tracking No.: |
|---|---|---|
| Memphis-TE Maxson STP | Memphis, Shelby County | TN0020729 |

| Photo No. | Date |
|---|---|
| 13 | 10-19-2016 |

**Description**
View of the influent digital flow meter.